assuming an analysis for Cu content is required, one takes a sample of the solution to be analyzed, spikes the sample with an enriched standard solution having a substantially different isotope ratio than the naturally-occurring ratio, introducing the spiked sample to a mass spectrometer, and records the measured mass ratio between the isotopes. The measurement is going to differ from the naturally-occurring ratio and the standard spike ratio, and from the measured ratio, knowing the quantity of the original sample, and the quantity of the spike solution, one can calculate the single unknown, that being the concentration of Cu in the original sample.

On page 18, line 8 insert the following paragraphs:

-- It is an object of the present invention to provide an analytical apparatus and an associated method to monitor fluid systems by extracting raw samples and modifying the same chemically and/or as to concentration with subsequent analytical analysis being performed with the assistance of automated computerized control.

It is a further object of the present invention to provide such a system that employs isotopic ratios in effecting such determinations on liquid samples.

It is another object of the present invention to provide such a system that has unique liquid handling subsystems, which provide for automated continuous processing.

It is another object of the present invention to provide such systems that facilitate decision control over raw sample amounts, as well as chemical modifications and dilutions thereto.

It is another object of the present invention to provide such a system that is adapted for online or adjacent analysis with respect to industrial process wet-baths.

These and other objects of the invention would be more fully understood from the following detailed description of the invention on reference to the illustrations appended hereto --.

Please replace the paragraph beginning on page 18, line 31 with the following:

Speciated Isotope Dilution Mass Spectrometry (SIDMS), as described in Kingston United States Patent 5,414,259 referenced above, has been developed to assess the quantification of species and also their transformations. In SIDMS a predetermined species is specifically isotopically labeled and introduced to accomplish such measurements. The species of interest is previously known and specifically evaluated. In this invention the labeled species (frequently multiple species simultaneously) are being created in solution and are not previously determined in composition and structure until evaluated for structural

information. Quantification is of the elemental ion and speciation information first established in-process through dynamic equilibrium established with a non-complexing salt of an enriched stable isotope in real time and in-process.

Please replace the paragraph beginning on page 24, line 29 with the following:

More specifically extraction modules 301, 305, 309, 313, and 317 are shown paired with wet-baths 303, 307, 311, 315, and 319, respectively. Each extraction module is connected to its wet bath by at least one fluid conduit, as module 301 is shown connected to bath 303 by exemplary conduit 321.

Please replace the paragraph on page 27, line 5 with the following:

There are three chemical introduction units labeled as units 1, 2, and 3, and labeled also element numbers 331, 333 and 335 respectively. These modules are for introducing chemicals for any of a range of purposes as described briefly above, such as to neutralize strong acid or base components of introduced samples. Each of these units is charged with appropriate chemicals for the kinds of baths to which the system will be devoted. Further, each is capable of introducing precisely measured quantities of these chemicals, under control of the computerized control system described briefly above. These chemical constituents are provided on demand to switching valve SV2, and thence to mixer 1 (341) via conduit 365.

Please replace the paragraph beginning on page 30, line 6 with the following:

In operation, plunger 515 is withdrawn with valve 511 connecting the syringe to path 509 through valve 507 switched to provide the proper path and open valve 503. A precise volume of the chemical solution is drawn into the syringe, and may then be injected at the appropriate time and at an appropriate rate by switching valve 511 to provide a path between the syringe and conduit 337 (see Fig. 3), which conducts the chemical introduced to SV2 and then mixer 1. A source of UPW (ultra pure water) is also made available through three-way valve 507, and nitrogen through valve 505. During syringe loading valve 505 is opened to prevent a vacuum being drawn on the reservoir by the syringe action.

Please replace the paragraph beginning on page 31, line 22 with the following:

Communication between primary syringe 601 and the arrangement of secondary syringes and other elements is through a switching valve 609. In the event 1ppm spike is needed, for example, syringe 619 is used through valves 621 and 623 to draw a precise amount from reservoir 611, and the 1ppm volume is then transferred to syringe 601

by switching valve 621 to the right-hand position, and switching valve 609 to transfer the volume through valve 603 and into syringe 601. When the spike is needed for a sample to be analyzed, switching valve 609 is positioned with valve 603 open to syringe 601 to allow syringe 601, by driving its plunger, to move the spike into conduit 355 and on to SV3 (see Fig. 3).

Please replace the paragraph beginning on page 32, line 8 with the following:

Assume that a 33 ppb spike is required. The first step is the same as for the 1 ppm spike as described above, that is, 1 ppm spike is drawn from reservoir 611 into syringe 619. During this operation valve 613 may be opened to a controlled-pressure nitrogen source for the same purposes as previously described. While the 1 ppm solution is drawn into syringe 619, valves 641, 639, and 667 are set to connect syringe 645 to reservoir 669, and a precise volume of dilution solution is drawn into syringe 645. Now valve 667 is closed, and valves 641, 639, 637, and 635 are reset to straight-through, connecting syringe 645 to mixer 631. At the same time, after syringe 619 is filled with the 1 ppm solution, valves 621 and 623 reset to connect syringe 619 to mixer 631. Syringes 619 and 645 are now operated in concert with syringe 643 with valves 625 and 627 set straight-through, and the volume of 1 ppm solution from syringe 619 is mixed with the dilution solution in syringe 645 through mixer 631 and into syringe 643. At the end of this operation accomplished through valve manipulation and manipulation of the appropriate syringe plungers, syringe 643 has a precise spike at 33 ppb.

Please replace the paragraph beginning on page 33, line 12 with the following:

Fig. 7 is a block diagram of a control system for an instrument in an embodiment of the present invention. Instrument 707 in Fig. 7 represents an instrument as shown abstractly in Fig. 2. With the exception of a computer station 215, comprising a computer 705 and a display unit 703, all of the components of the instrument are housed in a common cabinet, which may be positioned in a convenient location to fluid systems to be monitored, such as in a maintenance area outside the strict clean-room environment in a semiconductor fab. Computer 215 is analogous to the element with the same number in Fig. 2, and can be such as a high-end PC. Computer 215 is connected by a communication link 704 to the instrument 707, and this link can be any of several types, such as a serial link or a parallel communication link. Other links are also possible.

Please replace the paragraph beginning on page 34, line 1 with the following:

Microprocessor 217 is connected to an I/O interface 709 for controlling the